Requirements:

Part 1:

1- Set all Basic configurations Based on Logical topology

2- All Ip address for router interface, switch management interfaces, Pcs and servers

3- Configure router (R1, R2, R3) with Ospf protocol for routing, configure R2 to have default Route toward ISP

4- Verify the full connectivity between all pcs and servers

Part 2

5- Set all router to have encrypted passwords with min length 8 characters

6- Create 2 local user account one of them with privilege 15

7- Enable SSH management for all Routers

8- AAA authentication for all login lines(consol,vty) should be local case

Part 3

9- Only pc1 should be able to manage all internal Routers(R1, R2,R3)

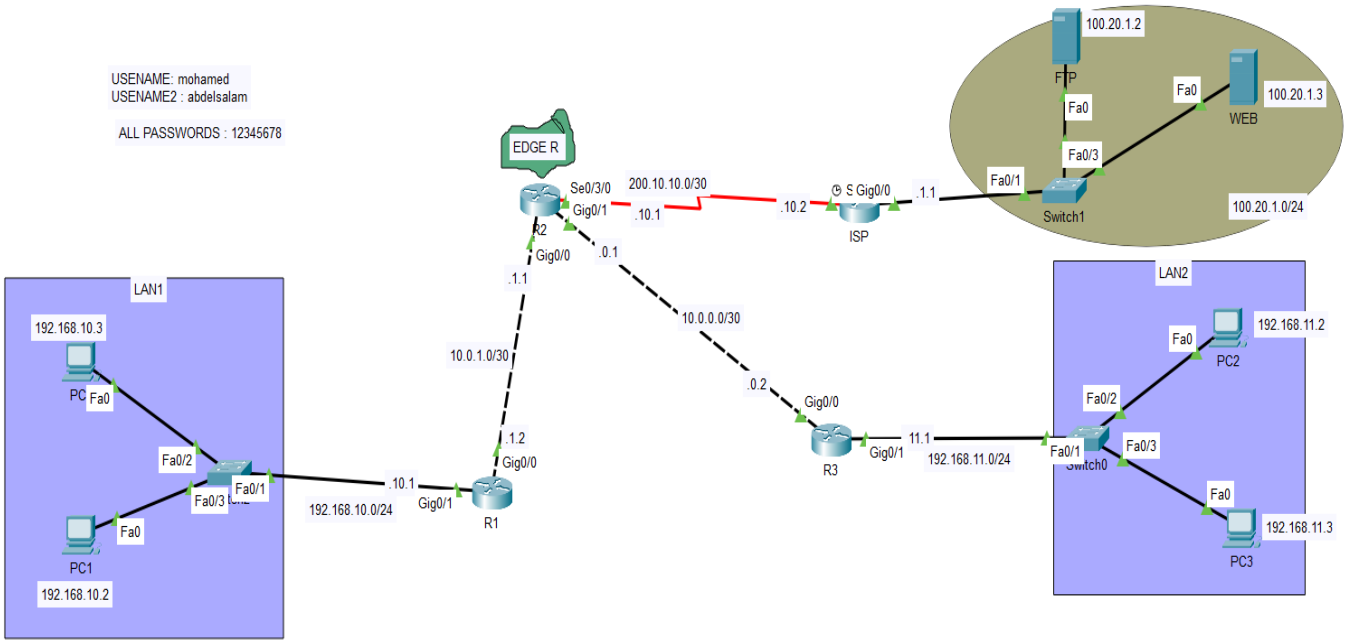
10- Users in Lan2 should be able to access only Ftp, Web serves

11- R2(Edge router) should block all external traffic except Returning traffic

12 - Users in lan 2 can use echo message to test connectivity with Lan1

Mohamed Abdelsalam – Quiz1

Full configuration:



R1 Configuration:

```
R1#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     10.0.1.2        YES manual up                    up
GigabitEthernet0/1     192.168.10.1    YES manual up                    up
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 10.0.1.1 to network 0.0.0.0

     10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
O       10.0.0.0/30 [110/2] via 10.0.1.1, 02:20:25, GigabitEthernet0/0
C       10.0.1.0/30 is directly connected, GigabitEthernet0/0
L       10.0.1.2/32 is directly connected, GigabitEthernet0/0
     192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/1
L       192.168.10.1/32 is directly connected, GigabitEthernet0/1
O    192.168.11.0/24 [110/3] via 10.0.1.1, 02:20:01, GigabitEthernet0/0
O*E2 0.0.0.0/0 [110/1] via 10.0.1.1, 01:20:37, GigabitEthernet0/0
```

Mohamed Abdelsalam – Quiz1

R2 Configuration:

```
R2#sh ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     10.0.1.1        YES manual up                    up
GigabitEthernet0/1     10.0.0.1        YES manual up                    up
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/3/0            200.10.10.1     YES manual up                    up
Serial0/3/1            unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
R2#
R2#
R2#sh ip rou
R2#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 200.10.10.2 to network 0.0.0.0

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.0.0.0/30 is directly connected, GigabitEthernet0/1
L       10.0.0.1/32 is directly connected, GigabitEthernet0/1
C       10.0.1.0/30 is directly connected, GigabitEthernet0/0
L       10.0.1.1/32 is directly connected, GigabitEthernet0/0
O    192.168.10.0/24 [110/2] via 10.0.1.2, 00:05:16, GigabitEthernet0/0
O    192.168.11.0/24 [110/2] via 10.0.0.2, 02:21:32, GigabitEthernet0/1
     200.10.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       200.10.10.0/30 is directly connected, Serial0/3/0
L       200.10.10.1/32 is directly connected, Serial0/3/0
S*   0.0.0.0/0 [1/0] via 200.10.10.2
```

R3 Configuration:

```
R3#show ip ro
R3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 10.0.0.1 to network 0.0.0.0

     10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C       10.0.0.0/30 is directly connected, GigabitEthernet0/0
L       10.0.0.2/32 is directly connected, GigabitEthernet0/0
O       10.0.1.0/30 [110/2] via 10.0.0.1, 00:06:23, GigabitEthernet0/0
O    192.168.10.0/24 [110/3] via 10.0.0.1, 00:06:13, GigabitEthernet0/0
     192.168.11.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.11.0/24 is directly connected, GigabitEthernet0/1
L       192.168.11.1/32 is directly connected, GigabitEthernet0/1
O*E2 0.0.0.0/0 [110/1] via 10.0.0.1, 01:23:04, GigabitEthernet0/0
```

Test Connectivity:

Realtime | Simulation

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	FTP	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC1	WEB	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC2	WEB	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC3	FTP	ICMP		0.000	N	3	(edit)	(delete)

Mohamed Abdelsalam – Quiz1

Apply authentication on all routers:

```
R1#line consc
R1#line con
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#aaa new
R1(config)#aaa new-model
R1(config)#
R1(config)#user
R1(config)#aaa auth
R1(config)#aaa authen
R1(config)#aaa authentication login defa
R1(config)#aaa authentication login default local
R1(config)#line con
R1(config)#line console 0
R1(config-line)#login de
R1(config-line)#login auth
R1(config-line)#login authentication def
R1(config-line)#login authentication default
R1(config-line)#exit
R1(config)#line vty 0 4
R1(config-line)#login auth
R1(config-line)#login authentication def
R1(config-line)#login authentication default
R1(config-line)#exit
R1(config)#
```

Create 2 local user account one of them with privilege 15

```
  <cr>
R1(config)#username mohamed privilege 15 se
R1(config)#username mohamed privilege 15 secret 12345678
R1(config)#username abdelsalam privilege 15 secret 12345678
```

Enable SSH management for all Routers

```
R2(config)#ip domain name cisco.com
R2(config)#
R2(config)#
R2(config)#
R2(config)#servi
R2(config)#service pass
R2(config)#service password-encryption
R2(config)#
R2(config)#cryp
R2(config)#crypto key
R2(config)#crypto key gen
R2(config)#crypto key generate rsa
The name for the keys will be: R2.cisco.com
Choose the size of the key modulus in the range of 360 to 4096 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.
```

```
R1(config)#
R1(config)#line vty 0 4
R1(config-line)#tran
R1(config-line)#transport inpu
R1(config-line)#transport input ssh
R1(config-line)#
```

Mohamed Abdelsalam – Quiz1

1ST access list:

```
R3(config)#access-list 10 permit 192.168.10.2
R3(config)#access-list 10 deny any
R3(config)#
R3(config)#line vty 0 4
R3(config-line)#acces
R3(config-line)#access-class 10 in
R3(config-line)#
```

Verify access list work for PC1 > R1&R2 works:

PC1

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ssh -l mohamed 10.0.1.1

Password:
R2>
R2>
R2>exit

[Connection to 10.0.1.1 closed by foreign host]
C:\>
C:\>ssh -l mohamed 192.168.10.1

Password:
R1>
R1>exit
```

R2

R1

SSH isn't working for PC0:

PC0

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ssh -l mohamed 10.0.1.1

% Connection refused by remote host
C:\>
C:\>ssh -l mohamed 192.168.10.1

% Connection refused by remote host
C:\>
C:\>
```

✓ **The message Is connection refused by remote access**

2nd access list:

Apply extended ACL on R3 int g0/1 :

R3

Physical Config CLI Attributes

IOS Command Line Interface

```
Password:
R3#
R3#
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#
R3(config)#acc
R3(config)#access-list 100 permit tcp 192.168.11.0 0.0.0.255 host 100.20.1.2 eq 21
R3(config)#acc
R3(config)#access-list 100 permit tcp 192.168.11.0 0.0.0.255 host 100.20.1.2 eq 20
R3(config)#
R3(config)#acces
R3(config)#access-list 100 permit tcp 192.168.11.0 0.0.0.255 host 100.20.1.3 eq 80
R3(config)#access-list 100 permit tcp 192.168.11.0 0.0.0.255 host 100.20.1.3 eq 443
R3(config)#
R3(config)#access-list 100 deny 192.168.11.0 0.0.0.225 any
                                ^
% Invalid input detected at '^' marker.

R3(config)#access-list 100 deny ip 192.168.11.0 0.0.0.225 any
R3(config)#
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#
R3(config)#int g0/1
R3(config-if)#acce
R3(config-if)#acces
R3(config-if)#ip ac
R3(config-if)#acces
R3(config-if)#ip acc
R3(config-if)#ip access-group 100 in
R3(config-if)#exit
```

Verification:

PC3 can reach ftp server

PC3

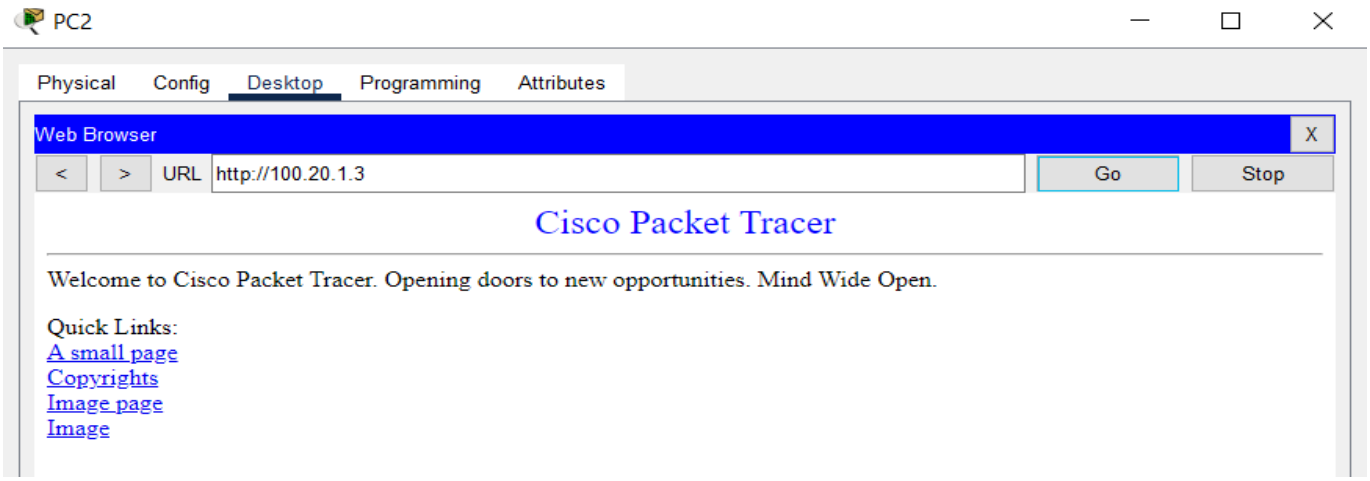
Physical Config Desktop Programming Attributes

Command Prompt

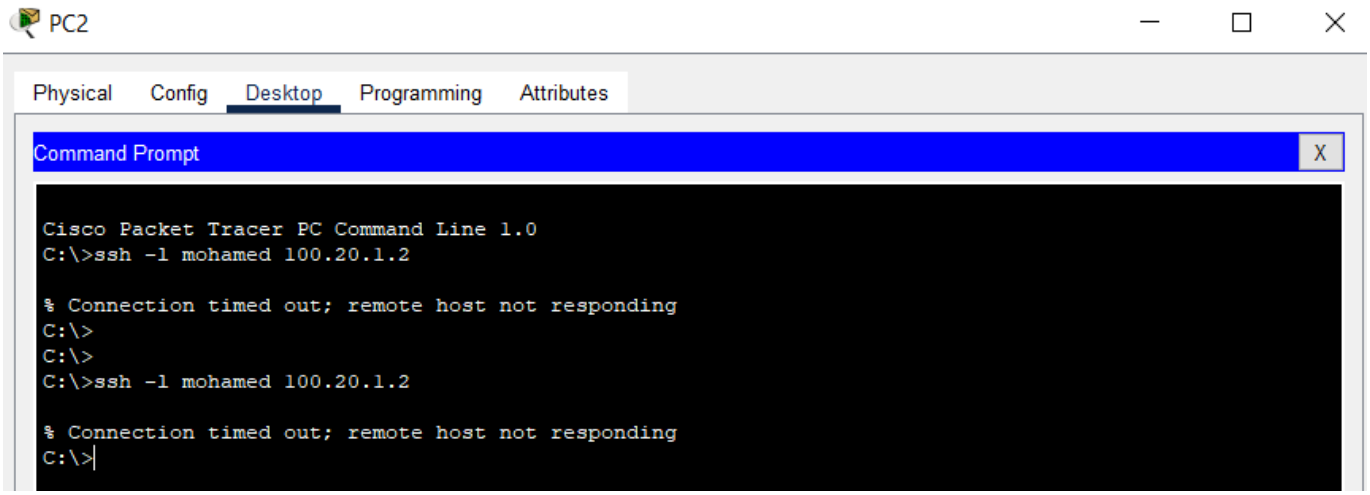
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ftp 100.20.1.2
Trying to connect...100.20.1.2
Connected to 100.20.1.2
220- Welcome to PT Ftp server
Username:mohamed
```

Mohamed Abdelsalam – Quiz1

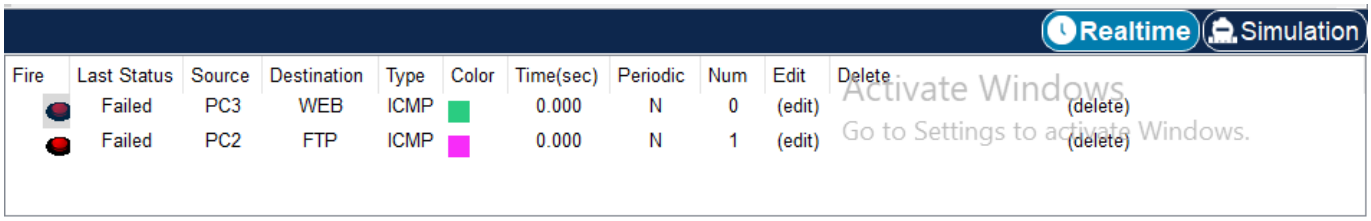
PC2 can reach WEB server



BUT PC2 can't use SSH



can't use PING in both PC2 & PC3



3RD access list:

R2

```
R2(config)#access-list 101 permit tcp any any established
R2(config)#access-list 101 permit icmp any any echo-r
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#access-list 101 deny ip any any log
                                            ^
% Invalid input detected at '^' marker.

R2(config)#access-list 101 deny ip any any
R2(config)#
R2(config)#int s0/3/0
R2(config-if)#ip acc
R2(config-if)#ip access-group 101 in
R2(config-if)#
R2(config-if)#exit
R2(config)#
R2(config)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#wr
Building configuration
```

Access list applied inbound to >> R2 (s0/3/0)

From outbound traffic coming from ISP (internet)

Copy Paste

```
R2#show access-lists
Standard IP access list 10
    10 permit host 192.168.10.2 (2 match(es))
    20 deny any (5 match(es))
Extended IP access list 101
    10 permit tcp any any established
    20 permit icmp any any echo-reply
    30 deny ip any any (31 match(es))
```

Verification:

WEB & FTP >> R2 -------BLOCKED

PC0 & PC1 >> WEB & FTP --------ALLOWED

Realtime Simulation

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	WEB	R2	ICMP		0.000	N	0	(edit)	(delete)
	Failed	FTP	R2	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC0	FTP	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC1	WEB	ICMP		0.000	N	3	(edit)	(delete)

4TH access list:

Users in lan 2 can use echo message to test connectivity with Lan1

R2

```
R2(config)#access-list 102 permit icmp 192.168.11.0 0.0.0.255 192.168.10.0 0.0.0.255 echo
R2(config)#access-list 102 permit icmp 192.168.10.0 0.0.0.255 192.168.11.0 0.0.0.255 echo-reply
R2(config)#access-list 102 deny ip any any
R2(config)#
R2(config)#int g0/0
R2(config-if)#ip access-group 102 in
R2(config-if)#
R2(config-if)#
R2(config-if)#
01:40:08: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.10.1 on GigabitEthernet0/0 from FULL to DOWN,
Neighbor Down: Dead timer expired

01:40:08: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.10.1 on GigabitEthernet0/0 from FULL to DOWN,
Neighbor Down: Interface down or detached

R2(config-if)#
R2(config-if)#int g0/1
R2(config-if)#ip access-group 102 in
R2(config-if)#
R2(config-if)#
```

permits **ICMP Echo Requests** from **LAN2** to **LAN1** (**in**-to-router)

permits **ICMP Echo Replies** from **LAN1** to **LAN2 also** (**in**-to-router)

Copy Paste